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EXAMINER	
JAWORSKI, FRANCIS J	
ART UNIT	**PAPER NUMBER**
3768	
NOTIFICATION DATE	**DELIVERY MODE**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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HT

Office Action Summary	Application No.	Applicant(s)	
	10/823,793	ABUHAMAD, ALFRED Z.	
	Examiner	**Art Unit**	
	Jaworski Francis J.	3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 19* is/are rejected.

7)☒ Claim(s) *20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102/103(a)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

[Claims 1 – 20 entered with the Request for Continuing Examination filed on October 4, 2007 are the claims under examination here.

The Examiner is re-visiting the entirety of the case based upon the claims in their amended form. The logic framework for this re-assessment is that the base claims' languages represent a set of IS and IS NOTs regarding limitation/non-limitations which are their attributes and which define the language boundary across what might be characterized as a contour that interfaces neighboring technology in a severality of directions or angles with which to come at exclusivity wordings. This logic is presented here as a fairness safeguard in order that the Examiner's rejection position present as a logical whole and be transparent on the record.

The computer program product claim (1) as exemplary:

1) IS directed to ultrasound imaging in a medical environment,

2) IS requiring that at least portions sufficient to define two planes, a reference plane and an additional plane be considered, with the latter generated with respect to the former based on organ specific data.
3) IS directed to automatic display of the at least two images in substantial simultaneity.
4) IS NOT limited to 'bedside' acquisition versus workstation acquisition at a later time&place.
5) IS NOT limited to a wholly automatic program; user input might conceivably assist in generating and defining the other plane (for example a user icon placement over an anatomically-identified ROI at a program interrupt to set a second plane location in an inter-active graphics software is not precluded.)
6) IS NOT demanding that the reference plane data and the organ specific data be related.
7) IS NOT limiting as to organ type.
8) IS NOT demanding of a real-time turnaround (i.e. 'substantially simultaneously' does not limit lag or start-to-finish time only display near-concurrency).
9) IS NOT limited to anatomic cross-sectional display. (An organ contour/internal border or a subframe ROI or a landmark point set or a rendered view from a voxel cubage may constitute either image.).
10) IS NOT pre-supposing of any specific geometric relationship between planes: parallel, intersecting, orthogonal are all embraced.
11) IS NOT limited to 'standard view' planar relationships e.g. as understood by a cardiologist, but merely to planar relationships which are related as per 2).
12) IS NOT limited to fiducials or anatomic landmarks as 'organ specific data' because it does not recite such. Temporal/functional/motional/metabolic/tissue microstructure is also 'osd' in nature.
13) IS NOT prohibitive of a pure geometric utilization of reference plane data to define an additional scanplane (see Response portion discussion of Teboul, patent to clarify the point).
14) IS NOT demanding that the planes/portions be fully acquired in sequence, first one in-toto then the other in-toto. (i.e. in a Doppler format for example scanlines might be built in packets across acquisition frames which individually are providing B-mode scanplanes. See also Poland et al col. 5 lines 32 – 35 and col. 6 lines 51 – 56.).
15) IS NOT demanding that the further plane be a real plane versus a synthesized one such as a rendered view or an interpolated plane or that 'defining' be 'defining for acquisition'.
16) IS NOT demanding that the reference plane or the further plane(s) be the literal planes and/or data eventually imaged. (meaning that the interrelationship may govern acquisition, and/or some intermediate step in image processing and/or the actual display so long as a correspondence to the simultaneous display occurs.)
17) IS NOT demanding that the process in its entirety be in ultrasound mode but rather that ultrasound involve to some extent in initial acquisition and in the simultaneous display. In other words the intermediate utilization step places no limit on image modality. (See discussion of Krause infra).

18) IS NOT excluding of a rotational component to the defining. (Again see Krause infra).
19) IS NOT limited to scans originating on the body exterior. (Ibid, infra).
20) IS NOT confined to three-dimensional imaging issues.

The interrelationship of the rejections and scope-interpretive points is further discussed in the Response portion.]

Claims 1, 7 – 8, 14 - 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poland et al (US6669641).

In Poland et al, echocardiographic imaging planes of reference and further types are gathered under tilt and/or rotate protocols termed a 'biplane format' per col. 2, for the purpose of providing a real-time display format which approaches full 3D rendering for the visualization of critical cardiac structures (valve/papillary muscle), and with scanline interleave while acquiring both component frames. When the user is studying the papillary muscle e.g. where infaction/ischemic halo might compromise a papillary muscle to cause valve prolapse the col. 10 line 13 – 42 protocol is enacted, and the graphics portion of the system utilizes data defining a reference plane by user cursor to generate a further plane by tilting about the reference plane. That is, since the user is operating with display cursors or icons as input, the fundamental anatomic definition is being established by the user and the graphics engine of the image processor acts to produce for the reference and further planes inter-related by the organ specific relationship for the simultaneous biplanar display as a high speed alternative to rendered 3D. Since the instructional protocol is not explicitly stated but must be present

since the cursor/icon controls are part of an interfacing program per col. 3 line 56, these would be understood to be present within central controller 120.

Claims 9 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poland et al as applied to claim 1 above, and further in view of Kamiyama et al (US6290648, of record) as applied in the previous action, i.e. that cols. 8 – 9 bridging suggests advantageously linking organ imaging to medical evaluation per structure recognition and comparison to a stored reference in order to identify and type abnormalities.

Claims 12 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poland et al as applied to claim 1 above, and further in view of Fenster (US5454371) since the latter establishes per col. 21 lines 19 – 20, col. 23 bottom para that sagital/coronal/axial-transverse-frontal (syn.) were known as conventional orienting views for simultaneous display including in cardiologic applications.

Claims 1 ,7 – 8 and 14 -15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamauchi (US6730032).

Yamauchi might be considered an alternative to Poland et al in the manner of solving the acquisition time delay artifact problem: when one seeks to quantitate cardiac volume from left ventricle component areas originating in bi-planar images 51, 52 of Fig.3 then the time-disjuncture that would degrade the composite volume calculation is negated by time interpolating within the second plane data set using the ECG signal as (col. 6 lines 51 – 56 and Fig. 18) a reference to inter-relate the two planes and produce

an interpolated second plane accurately representative of one which would have been obtained if true acquisition simultaneity had been possible. Hence the ECG/pressure pulse wave is organ-specific data which interrelates the two planes. This process is regulated in one variant by a ROM-stored program executed in a digital signal processor or a PC, and is executed in real-time.

Claims 12 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamauchi as applied to claim 1 above, and further in view of Fenster et al as applied above.

Claims 1, 7 – 10 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teboul (US5709206).

In Teboul, the invention derives from the oncologic principles that breast cancer is epithelial in origin where breast is an exocrine secretory gland and hence is most concisely investigatible by examining glandolobulular structure of the breast internal lobes organized along the duct architecture, and that ultrasound imaging is suitable to image the branching duct structures without mutagenic radiation and with better overall results (col. 22 lines 32 – 35 and col. 23 items 1-6), provided that there is a scanplane organization referenced to the ducts regarding long-axis view (col. 19 line 56 – col. 20 line 4, col. 21 lines 8-13) and that the ultrasound results are analyzed with regard to tumor behaviour regarding same (cols. 20 – 21 bridging.). This non-conventional acquisition mode serves as a basis for that invention. And a control program resident within the system is the basis for the view cumulation see col. 31 lines 44 – 48.

In either a largely manual mode of Fig 16 or a more automated version per Fig. 17 the user interacts with the control program in order to capture and assemble a complete duct pattern for the breast lobules as a set of connected segments collectively describing the long axis of the duct together with a radial clockface progression of such examinations and production of simultaneous views of either the Fig. 12 or Fig. 13 types as exemplary. Since these planes are referenced to and scaled by the dimensions of the areola as a common anatomic reference and additionall inter-relate as a unified duct system represented by the scanplane set the Teboul control program necessarily is using reference plane data provided by the user in order to define additional planes relative to the reference plane based upon this organ data. Teboul may be compiled in real-time in one variant per col. 32 bottom.

Claims I, 5,7 – 8, 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fowlkes et al (US6059727).

Fowlkes et al facilitates freehand scanning especially of the breast or fetus, in which conventional decorrelation techniques are used to positionally relate successive scanplanes in building up a 3D image within memory. (By conventional as per col. 3 lines 36 – 45, understood to refer to the col. 2 process in which the intrinsic scatterer geometry which 'fingerprints' an anatomic subregion can be tracked for its absolute displacement by metrics of de-correlation i.e. dissolution of the identifiable pattern as the scanplane advances into other tissue having a different fine structure pattern print.) , and is understood to pertain to simultaneous single-plane orthogonal views per 680 in

order to characterize anatomy under study. Fowlkes operates per resident software exemplified in Fig. 6.

Fowlkes et al extends to claim 5 since the usage includes cleft palate diagnosis col. 1 line 51.

Fowlkes et al may be implemented in real-time provided that they chintz and apply the interframe decorrelation only to representative subportions of the image data per col. 5 bottom

Claims 6, 12 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fowlkes et al as applied to claim 1 above, and further in view of Abdelhad (US6939301), since the latter teaches that for example in association with fetal assessment, BPD biometry and cleft palate assessment as called for in Fowlkes et al might be practiced col. 2 top, col. 3 line29, and for which 3D ultrasound is advantageous and would include the production of sagittal/coronal/frontal-axial-transverse (syn.) views was per se well-known, see col. 4 lines 23 - 28.

Claims 1 and 9 – 10 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Prause et al (US6148095).

Prause et al is directed to improving the 'best of both worlds' regarding intravascular imaging. Whereas x-ray fluoroscopic unit 210 provides gross anatomic characterization of the tortuous path of an artery, ultrasound intravascular imaging (IVUS) unit 220 provides radial ultrasound high frequency (high resolution but highly distance- attenuative) images of the constituent makeup and obstructive narrowings of

the artery wall. Since absent the x-ray overview which establishes a correct relationship of the successive IVUS near-distance radial images as akin to a haphazardly stack of poker chips that lean in tortuosity, use of the IVUS image set alone would result in a non-sensical 3D voxel cylinder with rotational (twist) as well as angulation disjunctures. The fluoroscopic bi-planar images when co-registered to the IVUS images by virtue of the centerline visualization serve to meld the angulation and rotation information so that the radial image stack has true fidelity along the artery path. As such the fluoroscopic mode is governing of the 'utilize data …' step since in the variant where this data component establishes the centerline see col. 5 lines 37 – 40 as well as twist and angulation of the centerline since the biplanar nature of fluoroscopy enables 3D orienting and feeds the calculation of rotational twist (including mechanical lag for driveshaft-driven single transducer scanheads) See also cl. 16 top portion. (We distinguish variants here because whereas one can use the catheter image to establish local centerline as a democratic center of the produced ultrasound radial scan disc, the catheter may be skewed within the vessel and therefore such an arbitration is not 'based on organ specific data' whereas the x-ray-derived vessel walls as centerline basis is such data.). Two image projections of the result as discussed col. 1 lines 25 – 27 are required to minimally characterize the plaque as a three-dimensional abnormality and are understood to be near-simultaneous for this integrated comprehension. At least the image data interpolation occurs under control of a resident algorithm; any meaningful implementation of Prause et al apart from software control of the internal and external processors would be prohibitively complicated. Prause et al extends to

rejection of claims 9 – 10 since a quantitative medical evaluation which is understood to relate to degree of occlusion is suggested to accompany the image, see col. 2 lines 28 – 30.

Claims 1, 7 - 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajan et al (US5906578).

Rajan et al is directed to an automated positioning protocol involving e.g. a neural network or rule-based fuzzy logic or expert system for which it would have been inherently obvious to provide a program product resident in the system's memory, and which allows to acquire ultrasound image data via transesophageal echocardiographic probe and (per col. 4 lines 3 – 54 and Figs 7 – 11 illustrating implementations) to automatically utilize data from a reference plane such as a standard view taken previously from the patient or from a library of reference views in order to generate and define a like or nearly-the-same plane in a current study as well as to effect a progression of study to a subsequent standard view based upon a subsequent reference.

Claims 2 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Poland et al or Fowlkes et al as applied to claim 1 above, and further in view of Winder (US6585647).

Whereas the former is directed to cardiology application including therefore consideration of standard views in cardiology and visualizing outflow tracts (Poland et al

valve study for example) and the latter mentions fetal studies e.g. for cleft palate, it would have been obvious in view of Winder col. 1 lines 51 – 67 to consider the fetal heart as embraced by ultrasound cardiology as a miniature variant for standard view and quantitative parameter production purposes, and that fetal head study might be made in association since fetal gestational age and/or abnormality typing can be wholistic regarding organ anatomies. [Yamauchi is excluded from the carry forward because the art subsequent to the filing date, see Schoisswohl (US6980844) and Brekke et al (US7261695) was suggesting that synchronization triggering per Yamauchi were insufficient in the fetal case because the ECG or pressure pulse sensor suggested in Y. were inapplicable/unreliable due to access, and therefore an imaged-tissue basis for a cardiocyclic trigger not being suggested in Y. (but generically known e.g. Jackson (US6673017) col. 2 lines 38 – 40) would weigh against its time alignment use in fetal cardiology applications. Rajan et al is excluded because there is no fetal TEE technology.]

Claims 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Poland et al, Yamauchi et al, and under 35 U.S.C. 102(b) as being anticipated by Teboul, Prause et al, Fowlkes et al, Rajan et al. Since the method and the structure base claims track the computer-resident software base claim but do not require a software basis in the recitation the arguments shift here to anticipation in each case for reasons set forth above in conjunction with the arguments apart from the software discussion portions.

Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prause et al, Fowlkes et al, since image registry based on feature co-registry, intercorrelation and 'best-fit matching can reasonably involve statistical processes in order to implement for an optimum answer choice.

Allowable Subject Matter

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Rejection Arguments

The Examiner firstly concurs with counsel that the Clark in view of Arling cannot sustain as claim 1 is now amended because both documents do not positively indicate an 'organ-specific data' basis for the inter-relationship of reference and the at least one other plane(s) as opposed to a rote increment-of-angle view interrelationship scheme per point (3).

However the claimed intellectual property boundary changes along with base claim wording revisions. When the technology issue set is complex, as is the case here where a display software/method/system image processing invention in its broadest claiming is being considered across all medical specialties, the boundary is more likenable to a contour involving multiple representative documents associated with their own respective 'angle' as is the case here. However by providing a claim interpretive IS/IS NOT list as one dimension of approach to achieving an exclusivity wording and then providing the rejecting documents in relation to the list in another dimension of approach, the intent is that a pattern emerges as though a fabric pattern from a loom as the cross-weave of the threads, and so the details are explained close to and exemplary of the broad interpretive abstractions under which which they are pertinent.

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Poland et al is applied as predatory upon interpretive points 5) , 13)-14) since when a physician-user interacts with a graphics processing portion to command view rotation or tilt of the second displayed plane in relation to the first based upon valve location (col. 7) or papillary muscle position (col. 10) then reference plane data is being utilized with the user as intermediary to relate a further view plane to an initial or reference plane (5). Once a reference plane is user-identified based on a heart-specific feature the machine utilizes the attendant specified geometry to define a further plane (13). Whereas the

scanplanes may be 'built' in an interleave as a further mitigant along with the bi-planar format speed to time-delay artifact, this does not negate consideration (14).

Yamauchi et al is applied as predatory upon the breadth of 5) considered with 12) and 15) since this fully automated scheme (5) while providing a reference plane 51 and then a further plane 52 in rote angular relationship thereto none-the-less time-aligns the cardiac long-axis views using a time interpolation for the second view derived from the organ's timing results in the second view plane being based upon organ-specific data in relation to the first plane (12), there being no exclusion of a synthesized view being the second view (15).

Teboul is applied as predatory upon point 7) since the claim is drafted independent of any particular organ or physician specialty. Teboul is also predatory upon points 5) and 10) – 11) and 13). Since the program product may be interactive and not wholly automatic, the physician may actively assist the image processor in defining the mammary duct along a planar view (5). Since there is no supposition as to what the planar inter-relationship is other than that it have such an organ-basis, there is thus no particular geometric inter-relationship supposition and a 'clock dial' format framework,.eg. Fig. 6a-b suffices as well as the dual image view formats of Fig. 12 and of Fig. 13 col. 31 lines 40 - 43 (10), (11). In Teboul an important related point is posed in col. 1 lines 61 – 65: a system set up such that the anatomic duct is 'understood' and given meaning by the system by referencing scan geometry being used by the user is equivalent to one in which the system 'understands' the organ specific landmark by tracking its own anatomic point fiducial set to reference the scan geometry progression (13). In other words, the largely manual Fig. 16 approach and the fully automated Fig. 17 approach both fulfill the 'utilize data...' portion. That is, 'utilize data' simply generically pertains to a carry-forward, whether the program/method/structure is exercising machine intelligence (pattern recognition/computer-assisted diagnosis etc.) or relying on the user to make the mental ascertainment. At the end of the day the reference and the further plane(s) are produced as inter-related according to organ specific data and by using a computer program product whether this product was master to or slave of the user of the imager interface.

Fowlkes et al in using an intercorrelation function which is an intrinsic e.g. normalized decay relationship with distance in order to identify a further acquisition scanplane as a vectored increment of displacement relative to a reference plane is predatory upon claim 1 in consideration of points2), 10), 12), 15) and 16). That is, since 2) requires only that sufficient data to define the planes be entertained (vs Folkes col. 4 lines 5 – 10) and no interplane relationship format is presupposed (10) and the organ-specific-data as a terminology cannot reasonably exclude the breast's unique regional fine scatterer patterns in a given plane (12), and there is no demand that the inter-relationship be at the level of display as opposed to registry at an intermediate stage(16) whereupon the acquisition planes have no actual visual meaning (15), any medical images

subsequently rendered from this voxel cubage such as conventional sagittal/coronal/frontal views as might be implied by the 'ortho(gonal) 3 slices 680' carry a correspondence debt to this initial registry process since the meatgrinder mathematics spelled out in col. 7 lines 15 – 62 relies on the registry to re-format the acquired freehand planes into a set as though conventionally stacked during a predictable geometrically grounded scan progression.

Prause et al is not only predatory primarily on point 17) since the alternate X-ray modality is the primary modality for the 'utilization ' step, but also points 7) because artery segments aren't excluded as 'organs' and 10) because (near) parallel plane definitions are embraced, as well as 2) because the vessel outline as determined in a fluoroscopic plane is a 'portion sufficient' as 'data defining a reference plane', as well as 16) because a longitudinal display, points 4) and 8) because of col. 7 lines 52 – 55, and finally points 18) and 19) because the rotational indexing of successive images within a scanplane stack and the internal probe origin of the scan are embraced within the claim.

Rajan et al is perhaps the closest document against the current base claims' wording since it provides organ specific data in order to match a current video image result with a like reference plane, point 8) embracing that the reference could be a temporally distant 'last year's study', points 10)and 20) embracing that the two planes could be near-identical i.e. a 'satisfactory match' so to speak and with the match being essentially a 2-D issue, point 19) permitting of TEE technology; and the patent being also applicable under the alternative view-progression likening. [Meaning that the 'match' of a single current view to a reference view is readable as a 2-D implementation, and the automatic progression of such matches during the cardiac study is also readable as a 3-D implementation in its totality.]

George Bernard Shaw on one occasion after finishing a long-winded speech remarked to his audience ' If I had known more I would have said less. ' , meaning that only after churning a topic does the short essence refine out. Here the 'said less' is that within referenced multi-planar medical image processing, organ specific data is used to establish standard cardiac views with user interaction (Poland et al), to provide a physiologic clock with which to time-align views (Yamauchi), to characterize spatially irregular duct or blood vessel patterns (Teboul, Prause et al), as a tissue-based position-sensor surrogate for freehand scanning (Fowlkes et al), and to set up comparison matching of scans for offsetting patient movements for a single view or succession of standard views (Rajan et al), for each of which when serving as a rejection basis points 1) – 20) serve to link back to an interpretive basis set for each rejection, and each rejection basis is carried forward against dependent claims to which it is reasonably applicable..

Finally, the following documents are provided to complete the case record:

Abuhamad (US2005/0251036) based upon co-pending application 11/089,040 was reviewed for claim content re double-patenting issues and found to be not in conflict.

Urbano et al (US6004270) is something of Yamauchi and something of Rajan et al since temporal alignment of reference and later images is sought as a 2-D image matching issue.

Selzer et al (US7074187), Saetre et all (US6488629) and Emery (US6402693) are directed to view standardization techniques via split screen viewing in relation to a reference for example Selzer et al involving display of a stacked, cross-sectional past reference view in conjunction with a current view on split screen so as to serve as a reference for automatic generation of a second 90 degree view

Lehtonen-Krause (US7227358) is directed to an MRI-based technique for automated algorithm-based determination and presentation of standard-views for the shoulder joint using anatomic landmarks.

Soler (WO 2007/049207 A1, of ineffective date) is directed to acquisition of an initial standard view either manually or by landmark recognition algorithm and deriving therefrom additional standard 2-D views from a 3-D volume data acquisition.

Berger (US5046499) is directed to providing anterior, left lateral (LL) and left anterior oblique (LAO) cardiac views simultaneously on a lightbox with explanation col. 5 mid-portion of a mathematical definition of a basis model and view relationship.

Johnson (US2003/0160786) is directed to obtaining a properly oriented 3D representation of e.g. the ventricle using anatomic landmarks however the landmarks are assigned by the user from the five standard reference views which are

conventionally obtained [para 0072] , and the result is used to provide correct quantitative values as opposed to any view revision or display, para [0110].

Frisa et al (US6709394) is directed to obtaining an arbitrary second and orthogonal view from a first organ view using a cursor-assisted system.

Zheng et al US2005/0101864, of ineffective date) is directed in paras [0010-0011} and subsequent passages to determining second and further orthogonal scanplanes based on a first 2-D view acquisition, including for purposes of correcting long axis border misalignments, 26 vs 28.

Roundhill et al (US6602194) is directed to defining a reference plane within the ultrasound 3D volume cubage to define orthogonal viewing planes for simultaneous display but based on geometric definitions as opposed to organ-specific data, see Fig. 9.

Murashita (US6878114, of ineffective date) is directed to automatic setting of ellipsoid axes for inter alia cardiac plane viewing based upon setting of reference points and lines by the user.

Soferman (US6375616) is directed to software which uses 3D fetal data to fit to a 3D model based on anatomic landmarks and then subsequently practice morphometric measurement on the model but without use of scanplane or planar referencing.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

Francis J. Jaworski
Primary Examiner

12-16-07